

# WE CLAIM

1. A method of reading data written on a data-holding medium using a data reader, said data being arranged into a plurality of data items each containing user data and non-user data, with said non-user data including one or more synchronisation fields, said method comprising:

reading data from said data-holding medium; and

- processing said data to detect at least one synchronisation field, said processing involving qualifying the detection of said synchronisation field to tolerate one or more errors therein.

2. A method according to claim 1, wherein detection of a said synchronisation field (sync) is qualified by determining a sync pattern formed by a part of said sync to be detected.

3. A method according to claim 2, wherein detection of a said sync pattern is qualified by determining that said sync pattern must be preceded by a predetermined pattern of data, such that sync detection is only enabled when said predetermined pattern of data is detected.

4. A method according to claim 3, wherein detection of said predetermined pattern of data occurring at any point in the reading of the data is accepted and sync detection enabled.

5. A method according to claim 3, wherein detection of said predetermined pattern of data allows no errors in the detection thereof to be tolerated.

6. A method according to claim 2, wherein each data item comprises two user data items in the form of first and second codeword pairs, and

three synchronisation fields, a forward sync positioned before said first codeword pair, a resync positioned between said first and second codeword pairs, and a back sync positioned after said second codeword pair, and detection of a said forward sync pattern or a said back sync pattern is  
5 qualified by determining that it must be preceded by a predetermined pattern of data.

7. A method according to claim 2, wherein sync pattern detection is qualified by splitting said sync pattern into at least two sync bytes, and  
10 determining that detection of at least one of said sync bytes constitutes detection of said sync pattern.

8. A method according to claim 7, wherein said sync bytes are configurable.  
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9. A method according to claim 7, wherein said sync bytes are substantially adjacent on said data-holding medium.

10. A method according to claim 7, wherein said sync pattern is split  
20 into first and second sync bytes, said first sync byte comprising a first portion of said sync pattern, and said second sync byte comprising the remainder of said sync pattern.

11. A method according to claim 10, wherein detection of each said sync  
25 byte is carried out using at least one mask register.

12. A method according to claim 11, wherein detection of each said sync byte comprises reading data from said data-holding medium into a register, ANDing said contents of said register with said contents of each said mask  
30 register, and comparing the result thereof to the AND of the contents of each said mask register and a register containing an ideal sync pattern.

13. A method according to claim 10, wherein detection of said second sync byte is allowed to override detection of the first sync byte.

14. A method according to claim 7, wherein each data item comprises  
5 two user data items in the form of first and second codeword pairs, and  
three synchronisation fields, a forward sync positioned before said first  
codeword pair, a resync positioned between said first and second codeword  
pairs, and a back sync positioned after said second codeword pair, and  
detection of any said sync pattern is qualified by splitting said sync pattern  
10 into two or more said sync bytes.

15. A method according to claim 2, wherein sync pattern detection is  
qualified by using a window and determining that any sync pattern detected  
whilst the window is open is considered as a true sync pattern, and any  
15 sync pattern detected whilst the window is closed is considered a spurious  
sync pattern.

16. A method according to claim 15, wherein said window is opened at a  
predetermined point.  
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17. A method according to claim 15, wherein said window is closed at a  
predetermined point after the point at which it is opened.

18. A method according to claim 16, wherein said point at which said  
25 window is opened is configurable.

19. A method according to claim 17, wherein said point at which said  
window is closed is configurable.

30 20. A method according to claim 15, wherein each data item comprises  
two user data items in the form of first and second codeword pairs, and  
three synchronisation fields, a forward sync positioned before said first

codeword pair, a resync positioned between said first and second codeword pairs, and a back sync positioned after said second codeword pair, and detection of a resync pattern is qualified by using said window.

- 5 21. A method according to claim 1, wherein sync detection takes place when data is read from said data-holding medium, before any further processing is carried out on said data.
- 10 22. A data reader arranged to read data from a data-holding medium, said data being arranged into a plurality of data items each containing user data and non-user data, with said non-user data including at least one synchronisation field, said data reader having at least one read head each reading data from the data-holding medium, and processing circuitry arranged to receive and process said data to detect at least one
- 15 synchronisation (sync) field, said processing involving qualifying the detection of said synchronisation field to tolerate one or more errors therein.
- 20 23. A data reader according to claim 22, wherein said processing circuitry is arranged to qualify detection of a said sync by determining a part of said sync to be detected, forming a sync pattern.
- 25 24. A data reader according to claim 23, wherein said processing circuitry includes at least one processing block whereby sync detection is qualified by determining that said sync pattern must be preceded by a predetermined pattern of data, such that sync detection is only enabled when said predetermined pattern of data is detected.
- 30 25. A data reader according to claim 23, wherein said processing circuitry includes at least one processing block arranged to split a said sync pattern into at least two sync bytes, and further arranged such that detection of at least one of the sync bytes constitutes detection of said sync pattern.

26. A data reader according to claim 23, wherein said processing circuitry includes at least one processing block arranged such that detection of said sync pattern is qualified by using a window and further arranged to  
5 determine that any said sync pattern detected whilst the window is open is considered as a true sync pattern, and a partial sync pattern detected whilst the window is closed is considered a spurious sync pattern.

27. A data reader according to claim 26, wherein said processing  
10 circuitry is arranged such that the point at which said window is opened is configurable.

28. A data reader according to claim 26, wherein said processing  
15 circuitry is arranged such that the point at which said window is closed is configurable.

29. A data storage device incorporating a data reader according to claim 22.

20 30. A computer readable medium having stored therein instructions for causing a processing unit to execute the method of claim 1.